

**USCMS Topical Workshop on
Water Cycle and Water Security**

2-3 August 2022
(All times are EDT)

2 August 2022 (Tuesday)

Chair: Gokhan Danabasoglu

09:00 Gary Geernaert: Welcome and Background

09:10 Ruby Leung: Workshop objectives and outcomes

Session 1: Modeling water cycle and water security: model development and evaluation

09:15 Elena Shevliakova: GFDL updates on modeling precipitation and land-atmosphere interactions (remote)

09:30 Dave Lawrence: CLM updates on modeling water cycle and water security (remote)

09:45 Ben Bond-Lamberty: E3SM updates on modeling terrestrial water cycle processes (in person)

10:00 Nate Chaney: Representing subgrid scale water processes (remote)

10:15 *Break*

Chair: Dave Bader

10:35 Darren Engwirda: Modeling land-river-ocean processes in coastal zone (remote)

10:50 Bryce Harrop: Evaluation of E3SM using water cycle metrics (remote)

11:05 Ruby Leung: Charge for breakout groups and anticipated outcomes

11:10 *Breakout discussion*

Group A: Lamarque, Harrop

Group B: Ramaswamy, Chaney

Group C: Tallapragada, Engwirda

12:10 *Lunch*

Session 2: Water cycle and water security: insights from observations and modeling

Chair: John Dunne

13:00 Ben Cook: Global projections of drought in CMIP6 ensembles (remote)

13:15 Isla Simpson: Discrepancy between models and observations in historical hydroclimate trends (remote)

- 13:30 Tricia Lawston: Progress and challenges in monitoring and modeling of irrigation (remote)
- 13:45 Yujin Zeng: Anthropogenic enhancement of precipitation in the Sahel-Sudan savanna by remote agricultural irrigation (remote)
- 14:00 Yadu Pokhrel: Global water cycle modeling and food-energy-water nexus (remote)
- 14:15 Tian Zhou: Impact of climate change and water management on floods (remote)
- 14:30 *Break*
- Chair: Susanne Bauer*
- 14:50 Amir AghaKouchak: Compound extreme events (remote)
- 15:05 Andy Wood: Model representations of runoff sensitivity (remote)
- 15:20 Ruby Leung: Reduced relative humidity over land with warming and implications for convection (in person)
- 15:35 Allegra LeGrande: Understanding atmospheric river changes using water tracers (remote)
- 15:50 Kai-Chih Tseng: Are multiseasonal forecasts of atmospheric rivers possible? (remote)
- 16:05 Bor-Ting Jong: Increasing occurrence of extreme precipitation over the Northeast United States: Using an ensemble of high-resolution climate model simulations (in person)
- 16:20 *Breakout discussion*
- Group A: Pawson, LeGrande
- Group B: Bauer, Jong
- Group C: Gokhan, Pokhrel
- 17:20 *Adjourn for the day*

3 August 2022 (Wednesday)

Session 3: Emerging approaches for modeling water cycle and water security: Ultra-high resolution modeling and AI/ML

Chair: Steven Pawson

- 08:30 Gokhan Danabasoglu: NCAR activities (in person)
- 08:45 Vijay Tallapragada: NCEP activities (in person)
- 09:00 Lucas Harris: A global view of moist convective processes using GFDL X-SHiELD (remote)
- 09:15 Peter Caldwell: Global storm-resolving modeling in E3SM (remote)
- 09:30 Shahryar Ahmad: Understanding non-stationarities in the water cycle with machine learning (in person)
- 09:45 Clara Orbe: GISS activities (remote)

- 10:00 *Break*
Chair: Vijay Tallapragada
- 10:20 Tapio Schneider: Machine learning within parameterizations as an inverse problem: Toward stable and generalizable models (in person)
- 10:35 Andy Prein: Kilometer-scale modeling of the hydrologic cycle: Lessons learned and challenges ahead (remote)
- 10:50 Naresh Devineni: The role of big data analytics in securing the future of water, energy and food (remote)
- 11:05 *Breakout discussion*
Group A: Bader, Orbe
Group B: Dunne, Prein
Group C: Gross, Harris
- 12:05 Breakout report back (Session 1: 5 min per group)
- 12:20 Breakout report back (Session 2: 5 min per group)
- 12:35 Breakout report back (Session 3: 5 min per group)
- 12:50 *Adjourn for the workshop*